EXTREME TRADING VOLUME AND EXPECTED RETURN

Study to Companies Listed in Indonesia Stock Exchange 2008-2012 Period

BACHELOR THESIS

Submitted as a requirement to complete Bachelor Degree (S1) at Bachelor Program of Faculty of Economics and Business Diponegoro University.

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MOTTO

لَا يُكَلِّفُ ٱللَّهُ نَفْسًا إِلَّا وُسْعَهَا ۚ لَهَا مَا كَسَبَتْ وَعَلَيْهَا مَا
ٱكْتَسَبَتْ ۗ رَبَّنَا لَا تُؤَاخِذْنَآ إِن نَّسِينَآ أَوْ أَخْطَأْنَا ۚ رَبَّنَا وَلَا تَحْمِلْ
عَلَيْنَآ إِصْرًا كَمَا حَمَلْتَهُۥ عَلَى ٱلَّذِينَ مِن قَبْلِنَا ۚ رَبَّنَا وَلَا تُحَمِّلْنَا
مَا لَا طَاقَةَ لَنَا بِهِۦ ۖ وَٱعْفُ عَنَّا وَٱغْفِرْ لَنَا وَٱرْحَمْنَآ ۚ أَنتَ مَوْلَىٰنَا
فَٱنصُرْنَا عَلَى ٱلْقَوْمِ ٱلْكَٰفِرِينَ ﴿٢٨٦﴾

"Allah does not charge a soul except (with that within) its capacity. It will have (the consequence of) what (good) it has gained, and it will bear (the consequence of) what (evil) it has earned. "Our Lord, do not impose blame upon us if we have forgotten or erred. Our Lord, and lay not upon us a burden like that which You laid upon those before us. Our Lord, and burden us not with that which we have no ability to bear. And pardon us; and forgive us; and have mercy upon us. You are our protector, so give us victory over the disbelieving people."

"My dream isn't to be 'the best', it's to be someone who I'm not ashamed to be. I believe if I don't give up my hopes and dreams, then there will always be a good ending."

"I dedicated this for you, Ibu, Ayah, and the whole family.
I'm so grateful for everything. I'll always work hard
to be the daughter you proud of"

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I admit that there are still many lacks in this thesis. Therefore, I gladly accept all criticsm and advices in order to improve this thesis. At last, I hope that this thesis will contribute knowledges to public, civitas academica, and for myself.

Thank you very much.

Semarang, July 18th, 2013

Novita Indah Nugraheni

ABSTRACT

This research aims to determine the difference in expected returns between various portfolios sorted based on extreme trading volume. This research conducted on 80 stocks listed in Indonesia Stock Exchange 2008 to 2012 period. This research is conducted following previous researches such as Amihud and Mendelson (1986), Brennan et. al. (1998), Datar et. al. (1998), Gervais et. al. (2001), Wang and Cheng (2004), and Baker and Stein (2004). This research also interacted the extreme trading volume with security characteristics such as past performance, firm size, and Book-to-Market or BM value.

The portfolio formation method in this research is refer to return portfolio approach by Gervais et. al. (2001). Using this method, portfolios formed and determined its average expected returns. After that T-test will be performed to determine the difference in expected returns between each contradicting portfolios like extreme high and extreme low volume, extreme high-winner stocks and extreme low-loser stocks, extreme high-large stocks and extreme low-small stocks, and extreme high-glamour stocks and extreme low-value stocks.

The results showed that there's no difference in expected returns between extreme high and extreme low volume, extreme high-winner stocks and extreme low-loser stocks, extreme high-large stocks and extreme low-small stocks, and extreme high-glamour stocks and extreme low-value stocks portfolios.

Keywords: extreme trading volume, past performance, firm size, BM value.

ABSTRAK

Penelitian ini bertujuan untuk mengetahui perbedaan tingkat pengembalian yang diharapkan pada berbagai macam portfolio yang didasarkan pada volume perdagangan ekstrim. Penelitian ini dilakukan pada 80 saham perusahaan yang terdaftar pada Bursa Efek Indonesia selama periode 2008-2012. Penelitian ini didasari oleh beberapa penelitian terdahulu seperti; Amihud dan Mendelson (1986), Brennan et. al. (1998), Datar et. al. (1998), Gervais et. al. (2001), Wang dan Cheng (2004), dan Baker dan Stein (2004). Penelitian ini juga mengkaitkan volume perdagangan ekstrim dengan karakteristik sekuritas seperti pencapaian masa lalu, ukuran perusahaan, dan BM value.

Metode yang digunakan dalam penelitian ini adalah metode portofolio yang digunakan Gervais et. al. (2001). Menggunakan metode ini, portofolio dibentuk dan dicari tingkat pengembalian rata-ratanya. Kemudian uji T akan dilakukan untuk mengetahui perbedaan tingkat pengembalian yang diharapkan pada setiap portofolio yang berlawanan seperti volume ekstrim tinggi dan rendah, volume ekstrim tinggi-saham yang menang di masa lalu dan volume ekstrim rendah-saham yang kalah di masa lalu, volume ekstrim tinggi-saham perusahaan besar dan volume ekstrim rendah-saham perusahaan kecil, dan volume ekstrim tinggi-saham glamor dan volume ekstrim rendah dan saham value.

Hasil dari penelitian ini menunjukkan bahwa tidak ada perbedaan dalam tingkat pengembalian yang diharapkan antara portofolio volume ekstrim tinggi dan rendah, volume ekstrim tinggi-saham yang menang di masa lalu dan volume ekstrim rendah-saham yang kalah di masa lalu, volume ekstrim tinggi-saham perusahaan besar dan volume ekstrim rendah-saham perusahaan kecil, dan volume ekstrim tinggi-saham glamor dan volume ekstrim rendah dan saham value.

Kata kunci: extreme trading volume, past performance, firm size, BM value.

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CHAPTER I

INTRODUCTION

1.1 Research Background

Investment could be defined as a commitment to forego current consumption to increase consumption purposes in the future, said Jones (2004). It means the people who invest rather gave up their satisfaction to consume something in the current time to achieve bigger compensation later on. Another investment purpose is to generate wealth, profit, or return either in the present or in the future. Sharpe et. al. (1997) define investment as "Sacrificing assets in the current time in order to acquire larger future assets".

The compensation in investment called return. Investment return divided into two components, which is yield and capital gain. Yield reflects the cash flow or income derived from an investment periodically. The form of yield is different depends on the kind of investment. Interest is yield for bond or deposit money and dividend is yield for stocks. Capital gain is a profit acquired when there are increase in stocks or bond price, and capital loss if the price is decreased.

Investor expects to get return as high as possible. However, another aspect that brought together with return in investment concept is the risk. Vaughan (1997) defines risk as alternative factor specifications, security characteristics, and the cross-section of expected stock returns. Jones

(2004) also defines risk as the uncertainty that expected outcomes may not be fulfilled. In general, risk is a probability that there will be a difference between the expected return to the realized one. Investor faced risks when they put their money into investment, so they demands proper return to compensate the risk that has been taken. Basically, investment main purpose is to gain maximal return at reasonable risk.

One of the risks faced by investor is liquidity risk. Liquidity risk is a risk an investor takes when they buys an investment that perhaps may not easily sold again. It caused by there are not enough trading activity to that investment, for example, stocks. So when an investor wants to sell his stocks, there is no buyer who wants to buy the stocks. It may cause loss to the investor, especially when he needs funds to buy other potential stocks at the moment. The lack of trading volume also discourage investor from gaining capital gain from trading activity because there are not enough buyer and seller to actually stimulate the price.

In the investment, trading liquidity of an instruments describe transaction market area of the instruments (i.e. stocks) or the ratio of the number of sellers and buyers. Stock liquidity can be shown through the trading volume fluctuation. The higher the liquidity, the easier trading transactions to carried out. Stock with low liquidity indicated that there are only a few people who trade it. It's very risky to trade on low liquidity stock because illiquid stock could be easily manipulated by market maker. It's also difficult for sellers to find buyers because the lack of traders.

Without liquidity, capital market has lost its role as investment vehicles and financing sources. Handa and Schwartz (1996) stated the importance of liquidity as "Investors want three things from the market: liquidity, liquidity, and liquidity".

Liquidity importance has not yet been understood with the same perspective by market participants. Investor and regulator measure it by trading frequency and volume. The higher volume and frequency of transactions, implies higher liquidity. Those criteria were used by Indonesia Stock Exchange (IDX) to determine the 45 most liquid stocks (LQ-45). Theoretically, an asset said to be liquid if the asset can be transacted quickly and at a low cost, in large quantities, without affecting the price. Even so, liquidity is often hard to explained and measured.

The purpose of this research is to determine the difference in expected returns between various portfolios based on trading volume. The subject to this research is companies listed in Indonesia Stock Exchange during 2008 -2012 period. This allows for a direct comparison with previous findings and researches which basically have similarities with this research such as Wang and Cheng (2004), Brennan et. al.(1998), Datar et. al. (1998), Chordia et. al. (2001), Amihud and Mendelson (1986), Baker and Stein (2004), Lee and Swaminathan (2000), Gervais et. al. (2001), and Miller (1977).

Wang and Cheng (2004) examine the relation between extreme trading volumes and expected returns for individual stocks traded on the

Shanghai Stock Exchange and the Shenzhen Stock Exchange. The study shows that extreme trading volume has negative relationship with expected returns. This research also found that this extreme volume–return relation significantly co-varies with security characteristics like past stock performance, firm size, and book-to-market values. In particular, stocks with extreme volumes are related to poorer performance if they are past winners, large firms, and glamour stocks than if they are past losers, small firms, and value stocks, respectively.

Some research conducted to discover the relation between liquidity measures and stock return found differences in the result. Brennan et. al. (1998), Datar et. al. (1998) and Chordia et. al. (2001) use dollar volume and share turnover as proxies for liquidity and find negative relation between stock returns and those liquidity measures. These founding are consistent with Amihud and Mendelson (1986) theory called liquidity premium hypothesis.

Baker and Stein (2004), on the other hand, stated that liquidity is also a sentiment indicator of irrational investors to short-sales constraint. If a large volume of winner stocks indicate that irrational investors dominate the market, it made trading volume is a good proxy for liquidity. Irrational investor will pushed stock prices over its fundamental value and usually will dropped back later, resulting in in a negative volume-return relation. However, large volume for loser stocks is less likely to be caused by irrational investors due to the short-sales constraint. Therefore, the

negative relation between volume and returns for past loser may be less obvious than past winners.

Lee and Swaminathan (2000) study shows that past trading volume provides an important link between momentum and strategies. This study tries to determine the stock's characteristic (glamour/value) impact to its subsequent returns. Along with finding that past trading volume also can be used to predict both magnitude and persistence of price momentum, this study also proved that trading volume or changes in volume reflect investor statement fluctuation. The investor irrationality-induced volume-return relation is referred as behavioral hypothesis.

The researches above stated that trading volume has negative relation with stock return, which trading volume is referred as relevant measure for liquidity. Several researches even mentioned that extreme trading volume has negative relationship with expected return.

However, there are researches which deliver different result. It said that trading volume has positive relation to stock returns. Gervais et. al. (2001) did a recent study of individual stock traded in New York Stock Exchange (NYSE). The study shows that stock that experiencing high volumes tend to be associated with high returns, and vice versa, which is labeled as the high-volume return premium. It was completely different with the previous research results, both liquidity premium and behavioral hypotheses. Gervais et. al. argue that their findings are consistent with visibility argument by Miller (1977). Miller stated that any shock that

attracts the attention of the investor should result in a subsequent price appreciation.

The researches above proved the statement with various measurements, yet there is also a wide difference from one side to another. Moreover, the 'extreme' part of the trading volume is used to determine the relation and the impact of one to another more distinctively.

This research also adds some variables which play important role to explain the dynamics between extreme trading volume and expected return. The variables will helps in understanding on how investor behavior and sentiment changes to certain condition. The variables used to compare investor sentiments to volume-return relationship are past performance, firm size, and book-to-market.

Past performance has been known to have an effect towards trading volume. A report from Deutsche Bank Research on the crisis of German online brokerage market argues that the declines in the equity markets have severely restrained the trading activities of the investors, eroding the broker's income. Similarly, Deloitte & Touche's 2001 survey of online securities also shows that the declining in stock prices at the previous period has led to slower growth of new online accounts and reduces trading volumes. Therefore, there might be relations between past performance and expected return. Why should past performance affect trading volume? Glaser and Weber (2005) said that recently, high return makes people overconfident and as a consequence, this investor trade

more subsequently. Barber and Odean (2002) analyzed a data set from a U.S discount broker and found that high past portfolio returns induce individual investors to trade more subsequently. In the other hand, similarly, Statman, Thorley, and Vorkink (2004) find that market wide trading volume in the United States is related to past market returns. Griffin, Nardari, and Stulz (2005) analyze the dynamic relation market-wide trading activity and returns in 46 countries and show that many stock markets exhibit a strong relation between trading and past returns. To summarize, so far empirical evidence suggest that past performance or past returns affect trading volume.

In some cases, firm size apparently has some effect on how investors sees extreme trading volume and expected returns. Bamber (1986, 1987) found a negative relation between firm size and trading volume. Based on the firm size, investor reaction to extreme trading volume and expected return might be different. Furthermore, this variable will be used to see how firm size influence investor sentiment towards volume-return relationship. Analyses on how the extreme volume-return relationship varies with firm size also help to distinguish between the liquidity premium and the behavioral hypotheses. Large stocks usually associated to be more liquid compared to small stocks, therefore we expect that the extreme volume-return relation is more obvious for small stocks than for large stocks if trading volume proxies for liquidity.

Book-to-market (BM) value is a ratio used to find the value of a company by comparing the book value of a firm to its market value. Book value is calculated by looking at the firm's historical cost or accounting value. Market value is determined in the stock market through its market capitalization. Wang and Cheng (2004) said that a security's BM is shown to be one of the important characteristic associated with the variation in the cross section on expected returns, although the interpretation of the BM effect has been debatable. Fama and French (1993, 1996) state that BM is a proxy for security's loadings on rational risk factors, whereas Lakonishok et. al. (1994) argue that BM effects represent the premium for relative distress, which is caused by investor irrationality. If BM effects caused by investor irrationality and trading volume also proxies the sentiment of irrational investors, this research would expect that the BM effect is associated with trading volume.

Thus, based on research gap and theory gap as explained above, there is a need to asses **"Extreme Trading Volume and Expected Return (Study at companies listed in Indonesia Stock Exchanges 2008 – 2012 Period)"**. Built on those reason, this research tries to determine the difference in expected returns between various portfolios sorted based on extreme trading volume which also varies with security characteristics such as past performance, firm size, and book-to-market value.

1.2 Problem Statement and Research Questions

The research problem will be built based on research gap from research results we've been mentioned before. One of the contradicting researches is conducted by Brennan et. al. (1998). Brennan et. al. (1998) examine the relation between stock returns, measure of risk, and several non-risk security characteristic, including the book-to-market ratio, firm size, stock price, dividend yield, and lagged returns. The research primary objective is to determine whether non-risk characteristic have marginal explanatory power relative to the arbitrage pricing theory benchmark, factor determined using Fama and French (1993) and Connor and Korajczyk (1988) approaches. Brennan et. al. used Fama-MacBeth-type regression using risk adjusted returns which provide evidences f return momentum, size, and book-to-market effects, together with a significant and negative relations between returns and trading volume. Other research with relatively similar results is Wang and Cheng (2004) research. Wang and Cheng (2004) proved that extreme trading volume and expected returns have negative relationship. Brennan et. al. research also included past performance, firm size, and book-to-market value to relate to volume-return relationship. Stocks with extreme volumes are related to poorer performance if they are past winners, large firms, and glamour stocks than if they are past losers, small firms, and value stocks, respectively.

On the other hand, Gervais et. al. (2001) investigating about the idea that extreme trading activity contains information about the future

evolution of stock prices. The research use two main samples data on NYSE stocks database between August 1963 and December 1996. The research find that stock experiencing unusually high trading volume over a day or a week trend to appreciate over the course of the following month, and vice versa. The research stated that this high-volume return premium is consistent with the idea that shocks in the trading activity of a stock affects its visibility, thus it attract attentions from the market. The attentions encourage the stock to gain subsequent demand and price. In other words, there are positive relation between trading volume and subsequent return. As a note, return autocorrelations, firm announcements, market risk, and liquidity don't seem to explain this result.

Based on those problems, research questions that would be studied in this research listed as follows:

1. Is there any difference in expected return between extreme high and extreme low volume stocks portfolios in Indonesia Stock Exchange during 2008-2012 period?
2. Is there any difference in expected return between extreme high volume-winner stocks and extreme low volume-loser stocks portfolios in Indonesia Stock Exchange during 2008-2012 period?
3. Is there any difference in expected return between extreme high volume-large stocks and extreme low-small stocks portfolios in Indonesia Stock Exchange during 2008-2012 period?

4. Is there any difference in expected return between extreme high volume-glamour stocks and low volume-value stocks portfolios in Indonesia Stock Exchange 2008-2012 period?

1.3 Objective and Research Benefit

1.3.1 Research Objective

The objectives of this study are:

1. To analyze the difference in expected return between extreme high and extreme low volume stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.
2. To analyze the difference in expected return between extreme high volume-winner stocks and extreme low volume-loser stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.
3. To analyze the difference in expected return between extreme high volume-large stocks and extreme low-small stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.
4. To analyze the difference in expected return between extreme high volume-glamour stocks and low volume-value stocks portfolios in Indonesia Stock Exchange 2008-2012 period.

1.3.2 Research Benefit

The benefits of this research are:

1. Benefit for academic community

   The results of this study are expected to contribute knowledge about the difference in expected returns between various portfolios based on its extreme volumes and its variations with past performance, firm size, and book-to-market value. Furthermore, results of this research hopefully can add empirical research repository about financial management especially concerning about investment.

2. Benefit for market players

   This research is expected to give approximation for market players about trading characteristic in Indonesia Stock Exchange, so it could be a reference material in future decisions considerations.

3. Benefit for readers

   This research is expected to enhance reader's knowledge and information about how's the mechanism of volume-return relationship in Indonesia. A well as reference materials to comparative study in the future regarding extreme trading volume and expected return which still comparatively rare compared to other fields in financial management.

1.4 Thesis Outline

Outline of this bachelor thesis is described as follows:

Chapter I Introduction

Chapter I provide the research background about extreme trading volume and expected return, problem discussion, research questions, research objectives, and research benefits.

Chapter II Literature Review

Chapter II contains underlying theories and reviews of the previous study that has the closer relationship to the subject of this study. It also contains operational and theoretical frameworks of the study and the hypotheses.

Chapter III Research methodology

Chapter III explains the research methods. This chapter also includes definitions and operational measurements of the variables, population and sampling frames, and data type and source. This chapter also describes analysis method used in this research.

Chapter IV Result and Analysis

Chapter IV presents research objects, data analysis, and discussion of the research hypotheses.

Chapter V Conclusions

Chapter V provides the conclusions and implications drawn from the research. Research limitations and suggestions also included in this chapter.

CHAPTER II

LITERATURE REVIEW

2.1 Theoretical Background

2.1.1 Liquidity

Liquidity in this research refers to stock liquidity. Stock liquidity is important aspect to consider at stock investment. Even though stock investment usually counted as long-term investment with dividend as its goal, some investor count stock investment as short-term investment with capital gain as its goal. For this short-term investor, liquidity is very important, because the amount of profit that they might gain depends on the stock liquidity itself. Madura (2003) said that liquidity is degree to which security can easily be liquidated (sold) without a loss of value. Stock liquidity reflects the speed and convenience of a stock traded without price reduction. It made stock liquidity is considered as the most important aspect by investors while trading at stock market. The more liquid one stock is, the more convenience the stock to traded or converted to cash. Short-term investor has to pay more attention to the liquidity, because liquid stock is easy to convert to cash and when the investor needs urgent funding, the stock can be easily traded.

The most recent and complete definition by Alzahrani (2011) stated that a market is considered perfectly liquid if a participant can trade at observed prices irrespective to the quantity, time and order type (buy or sell) desired. It is defined

as the ability to buy or sell significant quantities of a security quickly, anonymously and with little price impact. Trading volume used as proxy for liquidity measurement in this research. Madhavan & Cheng (1997) or O'Hara (2004) associate liquidity with trading volume. According to these papers liquid markets are those capable of absorbing high volume trades with no or low price impact.

1. Dimensions of Liquidity

Generally, liquidity is important characteristic of stock market that can have major impact on prices of securities. Therefore, is important to recognize, understand, and measure it, as said by Alzahrani (2011). Measures of liquidity are based on its several dimensions as it said on definitions before, such as:

a. Tightness or "bid-ask spread", is defined as cost of turning position around in a short period of time; the narrower the spread is, the more liquid the market is considered to be.
b. Depth describes an ability to close a deal after a number of similar deals before at the same price.
c. Breadth or Width measures an ability to close a deal while creating no impact on the market price.
d. Resiliency is the speed at which the price returns to the previous level after a large trade was closed.
e. Immediacy measures cost at which it is possible to immediately execute an order.

2. Liquidity Cost

Trading costs are the direct consequence of liquidity. As it is argued above, they are an important but often ignored component of its definition. Firstly, to understand the nature of liquidity cost, this following examples given by O'hara (2003); suppose all buyers of an asset arrive to a market place on Monday and all sellers on Tuesday. There might be consensus among them about the "true fundamental value" of an asset, but they are operating in a perfectly illiquid world and there will appear nothing like market price. Therefore, neither will trading activity emerge on Monday due to absence of sellers, nor on Tuesday. This setting shows how important an intermediary is – it will sell on Monday and buy on Tuesday. But it also requires certain compensation for matching services and as a result a spread between buying and selling prices appears.

Therefore, one of the reasons why trading costs appear is the necessity for presence of an intermediary on the market to ensure that it functions. Overall, liquidity costs in stock markets appear due to necessity to compensate an intermediary for ensuring continuity of trading by supplying liquidity on either side of the deal. Regardless of the type of the market these costs persist in one or another way.

3. Factors that Affect Liquidity

Sudana and Intan (2008) described the factors that affect stock liquidity as follows:

1) Financial leverage

Company management policy on financial decision reflected on its financial leverage. Increase in financial leverage has both positive and negative impact to stock holder depends on economy condition. In a prosperity condition, management has high expectations toward the business prospect in the future that encourage them to use more debt. This policy will reduce agency cost between stock holder and manager, because manager has to fulfill interest and principal payments with more discipline. It's in line with Jensen (1986) statement, "that debt reduces agency cost or, put differently, managers who are responsible for meeting interest and principal payments of debts are forced to choose positive net present value projects". Moreover, the increasing in financial leverage also followed by increasing in default risk so manager have to make a careful investment decision to avoid company from bankruptcy. If the company went bankrupt, manager will lose the control of the company and get bad reputation. This statement consistent with Grossman and Hart (1986), "increased default risk that accompanies high leverage may cause managers to make better investment decisions since bankruptcy may leads to lose control and reputation benefits". Increased financial leverage encourage manager to make best investment decision, reducing

information asymmetry between managers and investors, thus, increasing the liquidity of the firm's stock" (Frieder, L. and Rodolfo Martell, 2006).

2) Stock risk

There are two concepts in investment, return and risk. All investments are subject to risk. There are always be certain risk that faced by investor in order to gain certain return. It is generally believed that investor is awarded for taking the risk by return. Jogiyanto (2000) pinpoint that there are positive relationship between risk and return, means the higher the return, the higher the risk. Investment return divided into two, systematic risk and unsystematic risk.

Systematic risk is uncontrollable by organization and macro in nature. Systematic risks including market risk, purchasing power/inflationary risk, and interest rate risk. Unsystematic risk is controllable by organization and minor in nature. Unsystematic risks are firm-specific risks that derive from the nature of a particular business, such as business/liquidity risk, credit/financial risk, and operational risk.

Among the risks mentioned above, we will describe more about liquidity risk. Since liquidity, its measurement, and its relation with return are the concern of this research. Liquidity risks originate from the sale and purchase of securities affected by business cycles, technological changes, etc. The liquidity risks further classified into the following types:

a. Asset liquidity risks, the risk of losses arising from an inability to sell or pledge assets at, or near, their carrying value when needed. For e.g. assets sold at a lesser value than their book value.
b. Funding liquidity risks, the risk of not having an access to sufficient funds to make a payment on time. For e.g. when commitments made to customers are not fulfilled as discussed in the SLA (service level agreements).

3) Return On Asset

Return on Asset is a comparison between earnings before interest and tax (EBIT) with total asset. Positive ROA shows that from assets used for operational activities, company able to generate profit for the company. In the contrary, if the ROA negative, it shows that the company has loss. Company with bigger ROA has bigger chance to grow and improve.

Publicized financial report of a company provides information for the investors to determine ROA. High ROA implied that the company also has high effectiveness and efficiency in making profits. If market realized that a company stock is potential, there will be many offers to trade it. The increasing number of trading activity will affect stocks liquidity.

4) Market Capitalization

Market capitalization is a measurement of total value of a company. Total value of the company estimated by determined the purchase price and overall business at the current time. Market capitalization determined by stock volume and stock market price. The number of outstanding stock in the market relatively stagnant, that's why changes in market capitalization mainly caused by price fluctuation in the stock market. Sharpe, Alexander, Bailey (1997) stated that market capitalization has positive relationship with its investment liquidity. Big market capitalization indicates that the stock often traded by investors, or in other words has high liquidity.

5) Trading Volume

Trading volume is the amount of stocks traded in the market with consensual price between seller and buyer during trading days, either by themselves or by broker. Trading volume is an important issue for investor because trading volume reflects effect condition traded in the capital market. Trading volume can be determined by dividing traded stock in certain period with all listed stock (Jogiyanto, 1998). In this case, low volume indicates high bid-ask spread. Kokoskins and Baumanis (2001) stated that volume is negatively related to spreads, it means the higher bid-ask spreads, the stock will be more difficult to trade. The decreasing trading activity affects the liquidity so it became low.

6) Institutional Ownership

Institutional ownership usually has more information than individual ownership, so institutional ownerships were able to affect managerial decision and did analysis to keep an eye to company performance. It caused asymmetry information. Asymmetry information leads to adverse selection, where well-informed institutional investors will be able to sell their stock if individual investors put too high bid price and vice versa. This profit-taking act will disadvantage individual investor. If there are many institutional investor, asymmetry information will get higher and so the bid-ask spread will also getting higher. If the bid-ask spread high, the stock liquidity will decrease.

2.1.2 Return

Ang (1997) definition about return is the rate of profit that gained by the investor from its investment. Investor motivated to invest their money with expectation to gain a proper return. Without guarantee to gain return, investor will reluctant to invest. Ang also said that return has been an investor prime motive despite the type of the investment, whether it's a long term or short term investment. Return formulated as below:

$$Return = \frac{P_t - P_{t-1}}{P_{t-1}} \quad \text{.....(2.1)}$$

Where:

P_t = Stock price at period t

P_{t-1} = Stock price at previous period

Return components divided into two kinds, which is current income and capital gain. Current income is profit gained from periodic payment like deposit interest, bond interest, dividend, etc. It called ‘current’ because the profit usually paid as cash so it can be redeemed quickly. Interest coupon bonds paid as check or gyro and cash dividend for example. Another profit equivalent to cash is bonus stock and stock dividend, which are can be converted to cash by selling the stock attained.

Capital gain is profit from selling and buying price difference. Capital gain very dependent to market price of the instrument in question, which means the instrument should be traded in the market. Trading activities encourage price changes. The changes enlarge the possibilities for the investors to gain bigger profit. In the contrary, if there is lack of trading activities, the stock price will relatively stagnant. Price stagnancy may not appeal investor who tends to seek profit through sell and buy activity.

Eduardus Tandelilin (2001) said that return differentiated to realized return and expected return. Realized return is a return that has been calculated based on historical data. Realized return is important because it used to measure the performance of the stock or the company as well as the base to determining expected return to measure risk in the future. Expected return is the return investor can be expected in the future. Unlike realized return, expected return is not yet happened. Expected return in the future is a compensation for time and risk sacrificed for the investment. Eduardus Tandelilin also stated that return is a

factor that motivates investor to interact and also a reward for the investor bravery to take the risk of their investment.

Suad Husnan (1998) mentioned that expected return is an income to be received by investors on their investment in the issuer company in the future and the profitability is strongly affected by the company's prospect in the future. An investor will expect a certain return in the future, if the investors already achieve it so the return became realized return.

To maximize the return of the investment, investor emanates strategies to maximize expected return at various risk levels. One of the strategies is by investing stocks into portfolios. Portfolios defined as a set in which investor can investing various types of investments to reduce risks. Rational investor will choose to invest at the most efficient portfolio. Efficient portfolio as defined by Jogiyanto (2000) is either portfolio which give biggest expected return at certain risk level or portfolio which give smallest risk at certain expected return.

2.1.3 Trading Frequency

Trading frequency as defined by Eleswarapu and Khrisnamurti (1994) describe how many times issuer's stock has been traded in the certain period. Market interest in this stock can be derived from the number. Frequency positively related to the number of stock owner, so it also described the stock activeness in the trade market. Trading frequency affects the number of outstanding stocks. If the frequency high, the stock considered as active stock and

indirectly affect its trading volume. Active stock attracts investor to buy the stock so the volume will increase. It's coherent with Ang (1997), who said that the increasing demands of a stock encourage the increase in trading frequency. Yadav et. al. (1999) in his research also found that there are positive relationship between trading frequency and stock return.

2.1.4 Trading Volume

Trading volume is the number of stocks traded by issuers at stock market through broker and trader. Trading volume is an important matter to investor because stock trading volume portrays the conditions of stocks traded at capital market. Handa and Schwartz (1996) said that the most important thing to notice before decide an investment is its liquidity. Trading volume determined by dividing the number stocks traded at certain period with the number of listed stocks (Jogiyanto, 1998). Trading volume reflects the power of supply and demand which also reflects the manifestation of investor behavior. Ang (1997) stated that the increasing trading volume implies to the increased market power and vice versa.

Suad Husnan (1998) said that trading volume in extreme state counted as a sign that the market will improve or bullish. Bullish indicates the condition where market player shows their confidence and expectations that the strong results will continue. The increasing trading volume and stock price strengthen the indication

of bullish in the market. In the other side, when market player confidence that the trend will down, or weak result will continue, it's called bearish.

Active stocks usually have high trading volume and so the subsequent return is also high, said Chordia and Swaminathan (2000). They found that trading volume is a significant determinant of the lead-lag patterns observed in stock returns. Returns of portfolios containing high trading volume is on lead compared to portfolios with low trading volume stocks. The cause of the lag on low volume portfolios is because low volume trading portfolios tends to act sluggishly to new information.

Meanwhile Chen (2001) found that trading volume has positive and significant relationship with stock return when on the other side Cheng et. al. (2001) found that trading volume has negative and insignificant to stock return.

2.1.5 Past Performance

Past performance often associated with investor confidence towards certain stocks. Some theories argue that high returns make investors overconfident and as a consequence these investors trade more subsequently. Daniel, Hirshleifer, and Subrahmanyam (1998) propose a model in which the degree of overconfidence, modeled as the degree of the underestimation of the variance of signals, is a function of past investment success. Wang (1998) incorporate this way of modeling overconfidence in different types of models such as those of Diamond and Verrecchia (1981), Hellwig (1980), Grossman and Stiglitz (1980),

Kyle (1985), and Kyle (1989). These models predict that overconfidence leads to high trading volume. Odean (1998b) calls this finding the most robust effect of overconfidence. As long as past returns are a proxy for overconfidence, these models postulate a positive lead-lag relationship between past returns and trading volume. High total market returns make some investors overconfident about the precision of their information.

Investors mistakenly attribute gains in wealth to their ability to pick stocks. As a result they underestimate the variance of stock returns and trade more frequently in subsequent periods because of inappropriately tight error bounds around return forecasts. Gervais and Odean (2001) analyze the link between past returns and trading volume more formally. They develop a multiperiod model in which traders learn about their ability. This learning process is affected by biased self-attribution. The investors in the model attribute past success to their own abilities which makes them overconfident. Accordingly, the degree of overconfidence dynamically changes over time. They predict that overconfidence is higher after market gains and lower after market losses. Gervais and Odean (2001) show that greater overconfidence leads to higher trading volume, and that this suggests that trading volume will be greater after market gains and lower after market losses.

However, it is important to note that Gervais and Odean (2001) analyze an economy in which only one risky asset is traded. Thus, in their model, the market return is identical to the portfolio returns of investors. Accordingly, the Gervais and Odean (2001) model makes no predictions about which past returns (market

returns or portfolio returns) affect trading volume. In other words, overconfidence models by definition use investor's portfolios. These portfolios could be the market portfolio if no other assets are specified, but in a like manner actual investor's portfolios could be the market if they only hold market funds. Statman, Thorley, and Vorkink (2004) test the market trading volume prediction of formal overconfidence models using U.S. market level data. They find that market turnover, their measure of trading volume, is positively related to lagged market returns for months. Vector autoregressions and associated impulse response functions indicate that individual security turnover is positively related to lagged market returns as well as to lagged returns of the respective security. Griffin, Nardari, and Stulz (2005) investigate the dynamic relation between market-wide trading activity and returns in 46 countries.

Many stock markets exhibit a strong positive relation between turnover and past returns. These findings hold when they control for volatility, alternative definitions of turnover, differing sample periods, and are present at both the weekly and daily frequency. Barber and Odean (2002) test the prediction of overconfidence models using a data set from a U.S. discount broker. They analyze trading volume and performance of a group of 1,600 investors who switched from phone-based to online trading during the sample period. They find that those who switch to online trading perform well prior to going online and beat the market. Furthermore, they find that trading volume increases and performance decreases after going online. This finding is consistent with the prediction that high returns

in the past make investors overconfident who, as a consequence, trade more subsequently.

Furthermore, this paper investigate on how different past performance will affect trading activity. This study is part of the empirical literature that tests the prediction of past performance does have effects to trading activity and trading volume. More specifically, how past performance will affect investor point of view towards certain stocks if they have either high performance or low performance in the past.

2.1.6 Firm Size

Horne and Wachowichz (1997) describe firm size as total assets of a company and can be seen in the left side of the balance sheet. This statement goes along with Bala and Goyal (2000) statement who also said that mathematically, firm size can be measured by total asset. Size difference reflects companies' capability to compete in the market. Firm size can be measured by formula as follow:

Firm size = Stock price x Outstanding stocks .....(2.2)

In Goyal research, classification of firm size divided into three size groups according to the firm's market capitalization decile at the end of the year preceding the formation period: The firms in market capitalization deciles nine and ten are assigned to the large firm group, the firms in deciles six through eight are assigned to the medium firm group, and those in deciles two to five are

assigned to the small firm group. This research ignores the firms in decile one, as most of these firms do not included. Because Blume, Easley, and O'Hara (1994) postulate that the trading volume properties of large firms will differ from those of small firms, the analysis is done separately on each of these size groups.

Theoretically, smaller company attains higher return than bigger company. Small companies withstand economic changes better than bigger company because they focus on increasing the profit. Small company save its profits to lessen the debts, improved production capacity, or extended the company. Increase on the productivity seen as a good prospect in the future by investors. Furthermore, it encourages them to invest in the company. The investment made based on the minimum risk faced by the investor compared to the amount of the expected return.

In the other side, bigger company has bigger certainty compared to smaller company in order to reduce future prospect uncertainty. It means smaller company has bigger risk compared to bigger company. Francis (1986) and Elton and Gruber (1995) stated that bigger companies faced less risk compared to bigger companies. Bigger companies have better access to capital market. In other words, there are negative relationship between firm size and business risk.

Investor seeks safety in their investment, and because firm size reflect companies' ability to dodge risk, most investor usually will feel safer to invest in big companies stocks over smaller ones. Chen and Jiang (2001) also said that big companies tend to diversify their business, so when one sector of the business

experience loss, the company will hold up because the other sectors survived. With the diversification, company will hold a bigger chance to survive against failure or bankruptcy.

2.1.7 Book-To-Market Value

Book to market value is stock's book value divided by its market value. Book value is calculated from the company's balance sheet, while market value is based on the price of its stock. A ratio above 1 indicates a potentially undervalued stock (value stocks), while a ratio below 1 indicates a potentially overvalued stock (glamour stocks). Technology companies and other companies in industries which do not have a lot of physical assets tend to have low book to market ratios. Below is the formula for Book-to-Market ratio:

$$\text{Book-to-market ratio} = \frac{Book\ value\ of\ equity}{Market\ value\ of\ equity} \quad \text{.....(2.3)}$$

Or

$$\text{Book-to-market ratio} = \frac{Book\ value\ of\ equity\ per\ stock}{stock\ price\ per\ stock} \quad \text{.....(2.4)}$$

Book-to-market ratio usually used to determine stock profit. Other reasons why investors used book-to-market ratio to analyze investment as follows (Fitriatri, 2002):

1. Book value gives measurement that more stable compared to market price. Investors who use estimated discounted cash flow, book value can be used as benchmark to market price.

2. Accounting standard is usually the same for every company. Book-to-market can be compared to each company in the same sector to determine whether a company is undervalued or overvalued.
3. Company with negative earning couldn't be measured by price-earnings ratio, hence can be measured by book-to-market ratio. There are fewer companies with negative book value than negative earnings.

2.1.8 Volume-Return Theory

This research uses the following contradicting theories as its theoretical backgrounds. Thus, the result can be compared between the theories to determine which one is more suitable for the nature of this research. The theories are as follows:

1) Liquidity Premium Hypothesis

Liquidity premium hypothesis was proposed by Amihud and Mendelson (1986). The hypothesis stated that liquidity has correlation with stock return. Amihud and Mendelson used bid-ask spread as proxy for liquidity. The quoted ask (offer) price includes a premium for immediate buying, and the bid price similarly reflects a concession required for immediate sale. Thus, a natural measure of illiquidity is the spread between the bid and ask prices, which is the sum of the buying premium and the selling concession. The relative spread on stocks has been found to be negatively correlated with liquidity characteristics such as the trading volume, the number of shareholders, the number of market makers trading the stock and the stock price continuity.

Beside bid-ask spread, liquidity also proxy by other variables such as dollar volume, share turnover, and trading volume. Liquidity premium hypothesis found that stock return has negative relation with those liquidity measures. The same result also performed by Datar et. al. (1998) and Chordia et. al. (2001).

2) Behavioral Hypothesis

Behavioral Hypothesis was proposed by Lee and Swaminathan (2000). Lee and Swaminathan document some empirical evidence that trading volume or changes in volume reflect fluctuating investor sentiment. The hypothesis gave evidence that the information content of trading volume is related to market misperceptions of firms' future earnings prospects. Specifically, it provide strong evidence that low (high) volume stocks tend to be

under- (over-) valued by the market. This evidence includes past operating and market performance, current valuation multiples and operating performance, and future operating performance and earnings surprises. Investors' sentiment after acquire the information most likely affect their decision or point of view towards the stocks. One implication of the finding is that investor expectations affect not only a stock's returns but also its trading activity. The investor irrationality-induced volume–return relation is referred to as the behavioral hypothesis.

3) High-volume Return Premium

High-volume return premium was proposed by Gervais et. al. (2001). This theory shows that periods in which individual stocks experience extreme trading volume, relative to their usual trading volume, contain important information about subsequent stock returns. Specifically, periods of extremely high volume

tend to be followed by positive excess returns, whereas periods of extremely low volume tend to be followed by negative excess returns. This effect holds when the formation period for identifying extreme trading volume is a day or a week. It also holds consistently across all stock sizes.

This high-volume return premium constant with Miller (1977) founding. Miller stated that an increase in a stock's visibility will tend to be followed by a rise in its price. This prediction is highly consistent with the high-volume return premium, as visibility and demand shifts seem to be prompted by trading volume shocks. The plausibility of this explanation is reinforced by two findings: (1) the returns on the day/week of the volume shocks do not seem to affect the existence of the high-volume return premium; (2) past losers, which have arguably fallen out of investors' interest, tend to be particularly affected by shocks in their trading activity.

In general, this theory stated than when one stocks experiencing extremely high (low) trading volume, the changes will attract investor attention. The high volume will affect investor that the stock is highly sought by market and attracts them to trade on the said stocks. The act will lead to the increase in subsequent return. In the contrary, the stocks which experience low volume will fall out of investors' interest which leads to the decrease in subsequent returns. High-volume return premium believe that extreme trading volume has positive relationship with expected returns.

2.2 Previous Research

Researches on Extreme Trading Volume and Expected Return have been done by some of the researchers, as follows:

1. Chan Yun Wang and Nam Sang Cheng (2004)

   The research examines the relation between extreme trading volumes and expected returns for individual stocks traded on the Shanghai Stock Exchange and the Shenzhen Stock Exchange over the July 1994– December 2000 interval. Data used in this research divided into daily and weekly data. China stock market were picked as the object of this research because it usually independent of the US stock markets, and therefore, this study provides an independent validation test on the relation between extreme volumes and expected stock returns. Other reason is because volume-return relationship more pronounced in less transparent market and with more short-sales restrictions – something that can be found in China stock market. Those reasons explained why this research found the result that contrasted with the evidence obtained from the US data.

   This research tests the relation between extreme volumes and expected returns by examining average returns to volume-sorted portfolios. Each trading interval is split into a reference period and a formation period, which, respectively, consist of the first 49 days and the last day of the interval. The reference period is used to measure how unusually large or small trading volume is in the formation period. The number of shares traded is used as the measure of trading volume. In a

given trading interval, a stock is classified as a high (low) volume stock if its formation period volume is among the top (bottom) 5 out of 50 daily volumes, that is, top 10 percent, for that trading interval. Otherwise, it is classified as a normal volume stock. At the end of the formation period (at the formation date), we form portfolios based on the stock's trading volume classification for that trading interval. The results show that stocks experiencing extremely high (low) volumes are associated with low (high) subsequent returns.

This research also finds that the relation between extreme volumes and returns is significantly related to several security characteristics, including past returns, firm size, and book-to-market values (BM). In term of past performance, stocks that experience extreme volumes are associated with poorer performance if they are past winners, and associated with better performance if they are past losers. In term of firm size, stocks that experience extreme volumes are associated with poorer performance if they are large firms, and associated with better performance if they are small firms. In term of book-to-market values, stock that experience large volumes are associated with poorer performance if they are glamour stocks, and associated with better performance if they are value stocks. Interaction between extreme volumes and security characteristics contains more valuable information about stock price movements than extreme volumes alone.

2. Tarun Chordia, Avanidhar Subrahmanyam, and V. Ravi Anshuman (2001)

This research was given the evidence that the level of liquidity affects asset returns; a reasonable hypothesis is that the second moment of liquidity should be positively related to asset returns, provided agents care about the risk associated with fluctuations in liquidity. Motivated by this observation, this research analyzes the relation between expected equity returns and the level as well as the volatility of trading activity, a proxy for liquidity.

Data used in this research consist of monthly returns and other characteristics for a sample of the common stock of NYSE and AMEX-listed companies for the period January 1966 to December 1995. To be included in the sample for a given month, a stock had to satisfy the following criteria. First, its return in the current month, *t*, and in 24 of the previous 60 months had to be available from CRSP, and sufficient data had to be available to calculate the size, price, and dividend yield as of month *t*-2, and dollar volume and turnover over the previous 36 months. Second, sufficient data had to be available on the COMPUSTAT tapes to calculate the book to market ratio as of December of the previous year.

For each stock the following variables were calculated each month as follows: size (SIZE), book-to-market value (BM), dollar volume (DVOL), standard deviation of dollar volume (STDVOL), coefficient of variation of dollar volume (CVVOL), share turnover (TURN), standard deviation of share turnover (STDTURN), coefficient of variation of share

turnover (CVTURN), share price (PRICE), yield (YLD), cumulative return over the two months ending at previous month (RET2-3), cumulative return over three months ending tree months previously (RET4-6), and cumulative return over six months ending 6 months previously (RET7-12).

This research found out a negative and surprisingly strong cross-sectional relationship between stock returns and the variability of dollar trading volume and share turnover, after controlling for size, book-to-market ratio, momentum, and the level of dollar volume or share turnover. This effect survives a number of robustness checks, and is statistically and economically significant. This analysis demonstrates the importance of trading activity-related variables in the crosssection of expected stock returns.

3. Simon Gervais, Ron Kaniel, and H. Mingelgrin (2001)

This research investigates the role of trading activity in terms of the information it contains about future prices. More precisely, this research is interested in the power of trading volume in predicting the direction of future price movements. The two main samples used in this research are data on NYSE stocks from the stock database of the Center for Research in Security Prices (CRSP) between August 1963 and December 1996. The data were divided into two, daily and weekly samples. Every stock in each trading interval is again classified according

to trading volume and size. If the trading volume for a stock during the last week of a trading interval represents the top (bottom) weekly volume for i.e. 10-week interval, they classify that stock as a high (low) volume stock in that interval. Otherwise, the stock is classified as a normal volume stock.

This research study the effects of trading volume on future returns by forming portfolios of securities at the end of every formation period using the above volume classifications. In particular, this research seek to test the null hypothesis that trading volume does not contain any directional information about future prices. This is tested against the possibility that large (small) trading volume predicts high (low) returns. For this purpose, this introduce two portfolio formation approaches. At each formation date, they form a zero investment portfolio by taking a long position for a total of one dollar in all the high-volume stocks, and a short position for a total of one dollar in all the low-volume stocks of the same size group.

They find that individual stocks, whose trading activity is unusually large (small) over periods of a day or a week, as measured by trading volume during those periods, tend to experience large (small) returns over the subsequent month. In other words, a high-volume return premium seems to exist in stock prices. This high-volume return premium, holds when the formation period for identifying extreme trading volume is

a day or a week. It lasts for at least 20 trading days, and possibly for as long as 100 trading days. It also holds consistently across all stock sizes.

4. Malcolm Baker and Jeremy C. Stein (2004)

This research build a model that helps explain why increases in liquidity - such as lower bid-ask spreads, a lower price impact of trade, or higher share turnover - predict lower subsequent returns in both firm-level and aggregate data. The model features a class of irrational investors, who underreact to the information contained in order flow, thereby boosting liquidity. In the presence of short-sales constraints, unusually high liquidity is a symptom of the fact that the market is currently dominated by these irrational investors, and hence is overvalued.

This research develops an alternative theory to explain the connection between liquidity and expected returns. More specifically, this research focus is on understanding why time variation in liquidity, either at the firm level or for the market as a whole, might forecast changes in returns. This research implicitly accepts the premise that the traditional theory is best suited to explaining why permanent cross-firm differences in liquidity are associated with permanent cross-firm differences in expected returns.

The model rests on two key assumptions. First, there is a class of irrational investors, who underreact to the information contained in order flows. The presence of these irrational investors lowers the price impact of

trades, thus boosting liquidity generally. Second, there are short-salesconstraints. The short-sales constraints imply that irrational investors will only be active in the market when their valuations are higher than those of rational investors.

This research concluded that an unusually liquid market is one in which pricing is being dominated by irrational investors, who tend to underreact to the information embodied in either order flow or equity issues. Thus high liquidity is a sign that the sentiment of these irrational investors is positive, and that expected returns are therefore abnormally low.

5. Eugene F. Fama and Kenneth R. French (1993)

This research identifies five common risk factors in the returns on stocks and bonds. Previously, Fama and French (1992) study the joint roles of market β, size, E/P, leverage, and book-to-market equity in the cross-section of average stock returns. They find that used alone or in combination with other variables, β (the slope in the regression of a stock's return on a market return) has little information about average returns. Used alone, size, E/P, leverage, and book-to-market equity have explanatory power. In combinations, size (ME) and book-to-market equity (BE/ME) seem to absorb the apparent roles of leverage and E/P in average returns. The bottom-line result is that two empirically determined variables, size and book-to-market equity, do a good job explaining the

cross-section of average returns on NYSE, Amex, and NASDAQ stocks for the 1963-1990 period.

This paper extends the previous research in three ways; it extend the set of returns to be explained, the set of variables used to explain returns, and change the approach method from the previous one. The approach to testing asset-pricing models is different. Fama and French (1992) use the cross-section regressions of Fama and MacBeth (1973): the cross-section of stock returns is regressed on variables hypothesized to explain average returns. It would be difficult to add bonds to the cross-section regressions since explanatory variables like size and book-to-market equity have no obvious meaning for government and corporate bonds.

This paper uses the time-series regression approach of Black, Jensen, and Scholes (1972). Monthly returns on stocks and bonds are regressed on the returns to a market portfolio of stocks and mimicking portfolios for size, book-to-market equity (BE/ME), and term-structure risk factors in returns. The time-series regression slopes are factor loadings that, unlike size or BE/ME, have a clear interpretation as risk-factor sensitivities for bonds as well as for stocks.

This paper studies the common risk factors in stock and bond returns and tests whether these shared risks capture the cross-section of average returns. There are at least five common factors in returns. The factors as follows:

a. SMB (small minus big) is the difference between the returns on small-stock and big-stock portfolios with about the same weighted average book-to-market equity.
b. HML (high minus low) is the difference between the returns on high and low book-to-market equity portfolios with about the same weighted average size.
c. TERM is the difference between the monthly long-term government bond return (from Ibbotson Associates) and the one-month Treasury bill rate measured at the end of the previous month (from the Center for Research in Security Prices, CRSP). The bill rate is meant to proxy for the general level of expected returns on bonds. so that TERM proxies for the deviation of long-term bond returns from expected returns due to shifts ininterest rates.
d. DEF is the difference between the return on a market portfolio of long-term corporate bonds (the Composite portfolio on the corporate bond module of Ibbotson Associates) and the long-term government bond return.
e. RMO is the sum of the intercept and residuals from the regression of RM-RF on TERM, DEF, SMB, and HML.

In short, there are three stock-market factors: an overall market factor and factors related to firm size and book-to-market equity which are RMO, SML, and HML. There are two bond-market factors related to

maturity and default risks which are TERM and DEF. Stock returns have shared variation due to the stock-market factors, and they are linked to bond returns through shared variation in the bond-market factors. For example firms that have high BE/ME (a low stock price relative to book value) tend to have low earnings on assets, and the low earnings persist for at least five years before and five years after book-to-market equity is measured. Conversely low BE/ME (a high stock price relative to book value) is associated with persistently high earnings. Generally, the bond-market factors capture the common variation in bond returns. Most important the five factors seem to explain average returns on stocks and bonds.

6. Lukluil Maknun (2010)

The purpose of this research is to determine relation between trading frequency, trading volume, market capitalization, and trading day to its subsequent returns. Population used in this research is 141 companies listed in Indonesia Stock Exchange during 2006-2008 periods and 39 companies approved as samples. This research uses multiple linear regression analysis to calculate the data. Data used on this research is transaction data from each company for every 3 months, so for one company, there will be 12 observation data during 3 years observation periods. So there are 468 observation data.

Based on regression test, concluded the results as follows; First, trading frequency and stock return have negative coefficient beta so trading frequency have negative and significant relationship to stock return. It means the higher the trading frequency, the smaller company's stock return. Second, trading volume and stock return have positive coefficient beta, so trading volume and stock return have positive and significant relationship to stock return. It means the higher trading volume, the higher company's stock return. Third, market capitalization and stock return have negative coefficient beta so market capitalization have positive and significant relationship to stock return. It means the bigger market capitalization, the higher stock return. Fourth, trading day and stock return have negative coefficient beta so trading day have negative and significant relationship to stock return.

Table 2. 1
Summary of Previous Researches

Researchers	Title	Variables	Analysis Method	Results
Chan Yun Wang, Nam Sang Cheng (2004)	Extreme volumes and expected stock returns: Evidence from China's stock market	Trading volume, past performance, firm size, book-to-market value	T-test.	Extreme trading volume and expected returns has negative relationship. Stock with high volume followed by low subsequent returns and vice versa. Volume-return relationship also varied with security characteristic, which are past performance, firm size, and book-to-market value ad resulted as

				follows: Stocks with extreme volumes are related to poorer performance if they are past winners, large firms, and glamour stocks than if they are past losers, small firms, and value stocks, respectively.
Tarun Chordia, Avanidhar Subrahmanyam, V. Ravi Anshuman (2001)	Trading activity and expected stock returns.	Trading activity, dollar trading volume, share turnover, firm size, book-to-market ratio, momentum, dollar volume, share turnover.	Fama-MacBeth type regression.	Negative and strong cross-sectional relationship between stock returns and the variability of dollar trading volume and share turnover, after

				controlling for size, book-to-market ratio, momentum, and the level of dollar volume or share turnover. This effect survives a number of robustness checks, and is statistically and economically significant. This analysis demonstrates the importance of trading activity-related variables in the crosssection of expected stock returns.

Simon Gervais, Ron Kaniel, Dan H. Mingelgrin (2001)	The High-Volume Return Premium	Trading volume	T-test	Individual stocks, whose trading activity is unusually large (small) over periods of a day or a week, as measured by trading volume during those periods, tend to experience large (small) returns over the subsequent month. In other words, a high-volume return premium seems to exist in stock prices.

Malcolm Baker Jeremy C. Stein (2004)	Market Liquidity as a Sentiment Indicator	Trading Volume, Price, Share Turnover, Bid-Ask Spread, Equity Issuance.	Multiple regression	A model to determine relationship between liquidity measures to expected return. It found that an unusually liquid market is one in which pricing is being dominated by irrational investors, who tend to underreact to the information embodied in either order flow or equity issues. Thus high liquidity is a sign that the sentiment of these irrational investors is

				positive, and that expected returns are therefore abnormally low.
Eugene F. Fama and Kenneth R. French (1993)	Common Risk Factors in The Returns on Stocks and Bonds	Firm Size, Book-to-Market Value, Maturity, Default Risks.	Time-Series Regression Approach	Stock returns have shared variation due to the stock-market factors, and they are linked to bond returns through shared variation in the bond-market factors. Generally, the bond-market factors capture the common variation in bond returns. Most important the five factors

				seem to explain average returns on stocks and bonds. Firms that have high BE/ME (a low stock price relative to book value) tend to have low earnings on assets, and the low earnings persist for at least five years before and five years after book-to-market equity is measured. Conversely low BE/ME (a high stock price relative to book value) is associated with high earnings.

Lukluil Maknun (2010)	Trading Frequency, Trading Volume, Market Capitalization, and Trading Day Effect to Stock Returns.	Trading Frequency, Trading Volume, Market Capitalization, Trading Day.	Multiple Linear Regression Analysis	Trading frequency variable have significant negative effect on stock return. trading volume and market capitalization variable has significant positive effect on stock returns and trading day variable are not significant negative effect on stock returns.

2.3 Research's Model and Hypothesis

This research aims to determine the relation between extreme trading volume and expected return as well as volume-return relationship to security characteristics like past performance, firm size, and book-to-market value. The author formulates the discussed problem as well as limits the scope so that this

discussion can be more focused. This study will also present the research model along with appropriate analytical methods in order to achieve the purpose of the research. After that, author will collect the necessary data and process it with the appointed research model, analysis, and statistical methods. Conclusions of the research will be drawn from the processes.

The data required in this study consist of the factors that influence expected stock return of companies traded in Indonesia Stock Exchange. The factor that affect expected stock return including liquidity which proxy by trading volume, and securities characteristics such as past performance which proxy by stock price, firm size which proxy by market capitalization, and security's loading on rational risk factors which proxy by book-to-market (BM) value.

1. Extreme Trading Volume And Expected Return

Based on Brennan et. al. (1998), Datar et. al. (1998) and Chordia et. al. (2001) use dollar volume and share turnover as proxies for liquidity and find negative relation between stock returns and those liquidity measures. These foundings are consistent with Amihud and Mendelson (1986) theory called liquidity premium hypothesis. Baker and Stein (2004) stated that liquidity is also a sentiment indicator of irrational investors to short-sales constraint. If a large volume of winner stocks indicate that irrational investors dominate the market, it made trading volume is a good proxy for liquidity. Irrational investor will pushed stock prices over its fundamental value and usually will dropped back later, resulting in in a negative volume-return relation. Therefore, there are negative relation between volume and returns. Lee and Swaminathan (2000) study shows

that past trading volume provides an important link between momentum and strategies. Along with finding that past trading volume also can be used to predict both magnitude and persistence of price momentum. The investor irrationality-induced volume-return relation is referred as behavioral hypothesis.

Moreover, in the different market, when there are stocks that strongly attracted the market, whether because its high trading or low volume, as long as it attracts the attention of the market, there are high possibility of these stocks to gain price appreciation, as said by Miller (1977). Consistent with this argument, Gervais et. al. (2001) also found that there are positive relationship between extreme trading volume and stock returns during their research at NYSE.

H1: There is a difference in expected returns between extreme high volume and extreme low volume portfolios in Indonesia Stock Exchange during 2008-2012 period.

2. Extreme Trading Volume and Past Performance

Past performance has been known to have an effect towards trading volume. Deloitte & Touche's 2001 survey of online securities also shows that the declining in stock prices at the previous period has led to slower growth of new online accounts and reduces trading volumes. Therefore, there might be relations between past performance and expected return. Glaser and Weber (2005) said, high return makes people overconfident and as a consequence, this investor trade more subsequently. Barber and Odean (2002) analyzed a data set from a U.S discount broker and found that high past portfolio returns induce individual

investors to trade more subsequently. In the other hand, similarly, Statman, Thorley, and Vorkink (2004) find that market wide trading volume in the United States is related to past market returns. Griffin, Nardari, and Stulz (2005) analyze the dynamic relation market-wide trading activity and returns in 46 countries and show that many stock markets exhibit a strong relation between trading and past returns. Baker and Stein (2004) said that stocks that experience extreme volumes are associated with lower expected returns for past winners than for past losers if trading volume is a sentiment indicator.

H2: There is a difference in expected returns between extreme high volume-winner stocks and extreme low volume-loser stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.

3. Extreme Trading Volume and Firm Size

Bamber (1986, 1987) found a negative relation between firm size and trading volume. Based on the firm size, investor reaction to extreme trading volume and expected return might be different. This security characteristic will be used to see how firm size influence investor sentiment towards volume-return relationship. Analyses on how the extreme volume-return relationship varies with firm size also help to distinguish between the liquidity premium and the behavioral hypotheses. Large stocks usually associated to be more liquid compared to small stocks, therefore we expect that the extreme volume-return relation is more obvious for small stocks than for large stocks if trading volume proxies for liquidity.

H3: There is a difference in expected returns between extreme high volume-large stocks and extreme low-small stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.

4. Extreme Trading Volume and Book-to-Market Value

Wang and Cheng (2004) said that a security's BM is shown to be one of the important characteristic associated with the variation in the cross section on expected returns. Fama and French (1993, 1996) state that BM is a proxy for security's loadings on rational risk factors, whereas Lakonishok et. al. (1994) argue that BM effects represent the premium for relative distress, which is caused by investor irrationality. If BM effects caused by investor irrationality and trading volume also proxies the sentiment of irrational investors, this research would expect that the BM effect is associated with trading volume. In particular, low-BM stocks that experience extremely high volumes are associated with lower returns than those experiencing extremely low volumes.

H4: There is a difference in expected returns between extreme high volume-glamour stocks and extreme low volume-value stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.

Some of the variables described above can be presented as following operational and theoretical framework:

Figure 2. 1
Operational Framework

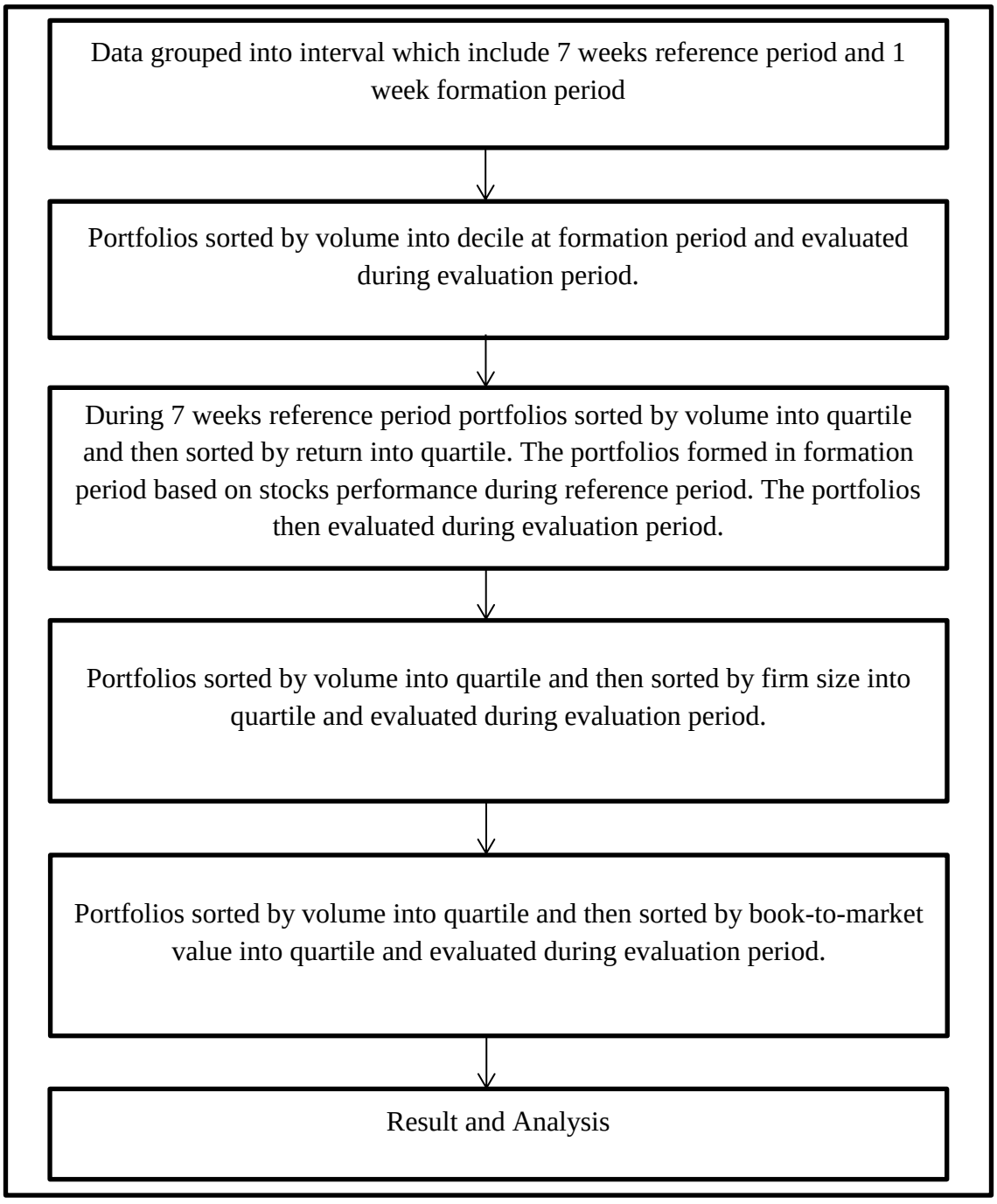
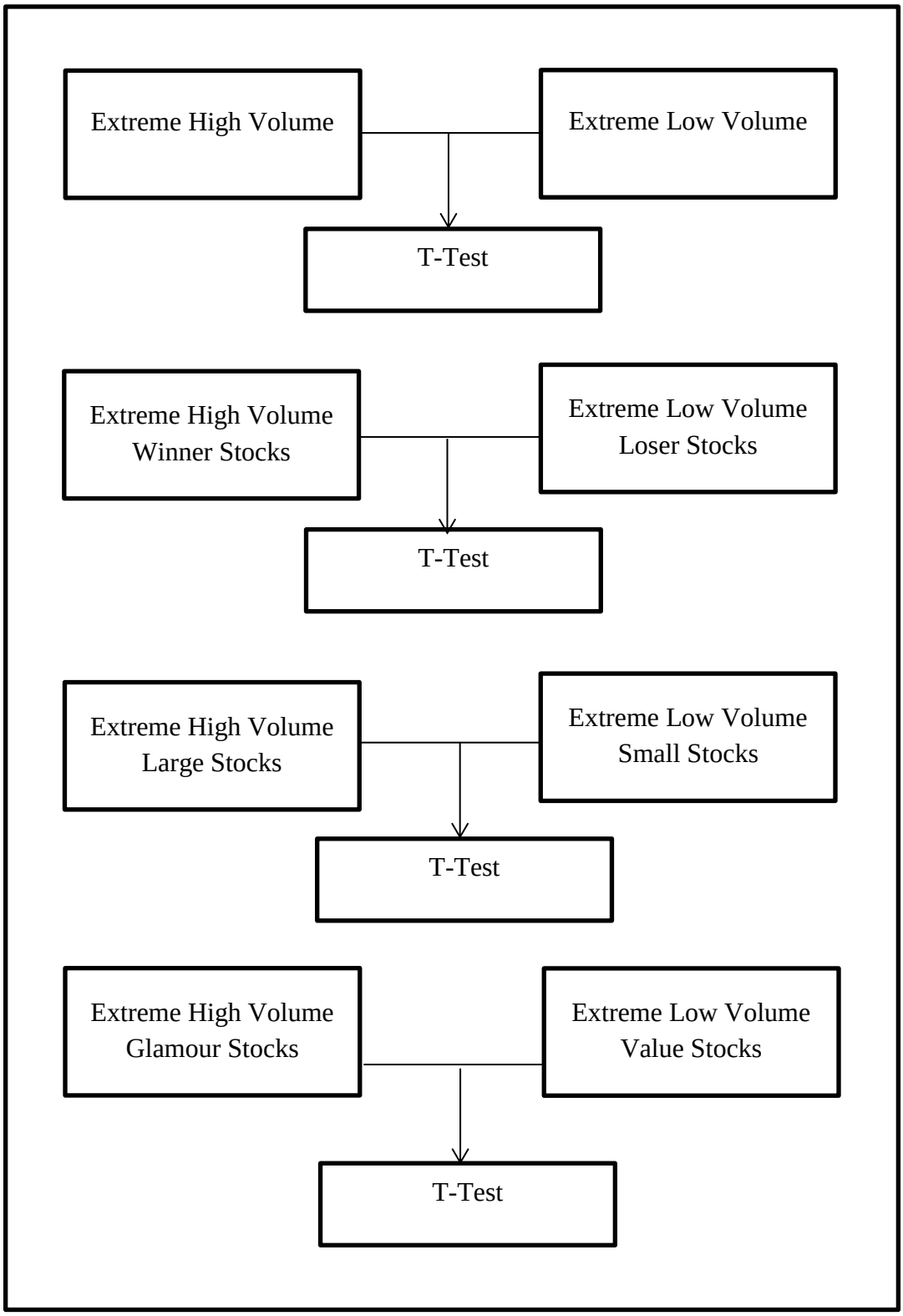


Figure 2. 2
Theoretical Framework



5. Research Hypothesis

Based on previous research and theoretical framework above, for the time about the hypotheses developed as follows:

1) H1: There is a difference in expected returns between extreme high volume and extreme low volume portfolios in Indonesia Stock Exchange during 2008-2012 period.
2) H2: There is a difference in expected returns between extreme high volume-winner stocks and extreme low volume-loser stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.
3) H3: There is a difference in expected returns between extreme high volume-large stocks and extreme low volume-loser stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.
4) H4: There is a difference in expected returns between extreme high volume-glamour stocks portfolios and extreme low volume-value stocks portfolios in Indonesia Stock Exchange during 2008-2012 period.

CHAPTER III

RESEARCH METHODS

This research ought to test the defined hypotheses using determined method. In this chapter this research will define research samples, data, data collection method, data sources, and data analysis method.

3.1 Research Variables and Operational Variables Definition

Research variable is an attribute that as a particular variant set by this research to be learned and drawn the conclusion from. Thus study used two types of variables, which are input and output variables. Input variables are the trading volume and other security characteristics which affect the expected return. The output is the return itself.

The variables used in this study were based on the literature review. Research variables used at tis research are as follows:

3.1.1 Return

Ang (1997) definition about return is the rate of profit that gained by the investor from its investment. Investor motivated to invest their money with expectation to gain a proper return. Without guarantee to gain return, investor will reluctant to invest. Ang also said that return has been an investor prime motive despite the type of the investment, whether it’s a long term or short term investment.

Suad Husnan (1998) mentioned that expected return is an income to be received by investors on their investment in the issuer company in the future. The profitability is strongly affected by the company's prospect in the future. An investor will expect a certain return in the future, if the investors already achieve it so the return became realized return. Return formulated as follow:

$$Return = \frac{P_t - P_{t-1}}{P_{t-1}} \quad \text{.....(3.1)}$$

Where:

P_t = Stock price at period t

P_{t-1} = Stock price at previous period

3.1.2 Trading Volume

Trading volume determined by dividing the number stocks traded at certain period with the number of listed stocks (Jogiyanto, 1998). Trading volume reflects the power of supply and demand which also reflects the manifestation of investor behavior. The increasing trading volume implies to the increased market power and vice versa.

Suad Husnan (1998) said that trading volume in extreme state counted as a sign that the market will improve or bullish. Bullish indicates the condition where market player shows their confidence and expectations that the strong results will continue. The increasing trading volume and stock price strengthen the indication of bullish in the market. In the other side, when market player confidence that the trend will down, or weak result will continue, it's called bearish.

This research will sorted all stocks in each formation period to decile based on trading volumes. A stock is classified as extreme high volume stock if its position is in the top 10% or decile 1. On the other hand, a stock is classified as extreme low volume stock if its position is on the bottom 10% or decile 10.

3.1.3 Past Performance

Wang and Cheng (2004) defined past performance as the achievement of one stocks, whether is gain or lose, during periods prior to current time or formation period (in portfolio forming case). Past performance often associated with investor confidence towards certain stocks. Some theories argue that high returns make investors overconfident and as a consequence these investors trade more subsequently.

This research will sorted all stocks in two steps. After sorted to quartile based on the trading volume, it will sorted again based on the returns. A stock is classified as winner stock if its returns are in the top 25% or quartile 1 during 7 weeks of reference formation prior to each formation period and a stock is classified as loser stock if its returns are in the bottom 25% or quartile 4 during 7 week reference period prior to each formation period.

3.1.4 Firm Size

Horne and Wachowichz (1997) describe firm size as total assets of a company and can be seen in the left side of the balance sheet. This statement goes along with Bala and Goyal (2000) statement who also said that mathematically, firm size can be measured by its market capitalization. Size difference reflects

companies' capability to compete in the market. Market capitalization can be measured by formula as follow:

Market Capitalization = Stock price x Outstanding stocks .....(3.2)

This research will sorted all stocks in two steps. After sorted to quartile based on the trading volume, it will sorted again based on the market capitalization at the end of the year preceding the formation period. A stock is classified as large stock if its market capitalization is among the top 25% or quartile 1. A stock is classified as small stocks if its market capitalization is among the bottom 25% or quartile 4.

3.1.5 Book-to-Market Value

Book to market value is stock's book value divided by its market value. Book value is calculated from the company's balance sheet, while market value is based on the price of its stock. A ratio above 1 indicates a potentially undervalued stock (value stocks), while a ratio below 1 indicates a potentially overvalued stock (glamour stocks). Technology companies and other companies in industries which do not have a lot of physical assets tend to have low book to market ratios. Below is the formula for Book-to-Market ratio:

$$\text{Book-to-market ratio} = \frac{Book\ value\ of\ equity}{Market\ value\ of\ equity} \quad \text{.....(3.3)}$$

This research will sorted all stocks in two steps. After sorted to quartile based on the trading volume, it will sorted again based on the B/M value. BM value is a ratio of the book value of the company for the fiscal year prior to the

formation period to the market value at the end of December prior to the formation to the formation period. A stock is classified as glamour stock if its BM values are among the top 25% or quartile 1 and classified as value stocks if its BM values are among the bottom 25% or quartile 4.

Table 3. 1
Operational Definition

Variable	Definition	Formula	Scale
Return	The rate of profit that gained by the investor from its investment.	$\frac{P_t - P_{t-1}}{P_{t-1}}$	In percentage (%)
Trading Volume	The number of stock traded at the certain period.	$\frac{number\ of\ stock\ traded\ at\ certain\ period}{number\ of\ listed\ stocks}$	In numeric number (IDR)
Past Performance	The achievement of one stocks, whether is gain or lose, during periods prior to current time or formation period.	*Return of t-1*	In percentage (%)
Firm Size	Total assets of a company.	*Stock price x Outstanding stocks*	In numeric (IDR)
Book-to-Market Value (BM)	Stock's book value divided by its market value	$\frac{Book\ value\ of\ equity}{Market\ value\ of\ equity}$	In percentage (%)

3.2 Population and Research Samples

Population used in this research is companies listed at Indonesia Stock Exchange from 2008 to 2012 period. Sampling method used in this research are non-random sampling and purposive sampling. Purposive sampling is used to determine sample selection, which means non-probability sample which custom designed to exact criteria depends on the research. Criteria used are as follows:

a. Stocks traded at Indonesia Stock Exchange at least 6 months prior to the formation period or 1 January 2008.
b. Stocks that are banks, investment trust, real estate, and investment companies are excluded.
c. The firm must have available information on trading volume and relevant accounting data during research period.
d. Samples must be actively traded during research period.

After purposive sampling has done, this research have 80 stocks as samples which meet the requirements above. The list of the samples can be found at appendix.

3.3 Data Type and Source

Type of data used in this research is secondary data, which is data that not obtained by researcher directly. Secondary data is a data compiled by bank data from institution or organization and published to public and data user. As said by Sekaran (2000), secondary data are company resources or archive, government publication, and industry analysis offered by media such as website, paper release,

internet, and other publication. Data used in this research are secondary data as follows:

a. Trading volume for each sample during research period
b. Historical data for each sample during research period
c. Size/market capitalization for each sample during research period
d. Book-to-market value for each sample during research period

In this research, secondary data obtained from books, journal, thesis, articles, and websites related to the topics which have been selected such as those reports which published in range 2008-2012 of range.

3.4 Data Collection Method

Data in this research are collected by following methods:

1. Documentation

   Documentation performed by data collection from bank data like Indonesia Stock Exchange Corner or by downloading data objects via websites. Websites used as source of this research are as follows:

   a. www.idx.com
   b. finance.yahoo.com

2. Sampling Method

   Samples picked non-randomly. Sampling method used in this research is purposive sampling. It means samples are picked and designed to fulfill several requirements to be count as proper for the research. The number of

samples is not specifically designated. It may be as many as possible as long those samples meet the requirements.

3. Literature Study

   Literature study used to collect data which couldn't be obtained from financial report or historical data like theories, definitions, previous research, etc. The data was obtained from books, journals, thesis, magazines, websites, etc.

3.5 Data Analysis

This research will use quantitative analytical methods. Quantitative analytical methods used in this research such as mathematics and statistical models. Mathematics models to determine the variables and statistical models to determine the characteristics of the data.

3.5.1 Stock Formation

Stock formation period in this research is one week. Portfolios are formed using a reference return portfolio approach similar to that of Gervais et. al. (2001). The weekly sample is constructed as follows. The time interval between January 2008 and December 2012 is divided into 29 non-overlapping intervals. Each trading interval consists of a 7-week reference period and a 1-week formation period with 1 week lag between reference period to formation period. The lag is allowed to avoid possible bid-ask spread and lead-lag effects.

In this research, due to the time constraints there will be only 26 intervals mainly calculated. It is noted that the extreme volume as defined previously is an

indirect measure of liquidity same as share turnover, when the firm's total share outstanding remains unchanged over the reference and formation periods.

Table 3. 2
Trading Intervals 2008-2012 Period

Interval	Reference Period							Formation Period
	1	2	3	4	5	6	7	
1	04-Jan-08	09-Jan-08	18-Jan-08	25-Jan-08	01-Feb-08	06-Feb-08	22-Feb-08	06-Mar-08
2	14-Mar-08	19-Mar-08	28-Mar-08	04-Apr-08	11-Apr-08	18-Apr-08	25-Apr-08	09-May-08
3	16-May-08	23-May-08	30-May-08	06-Jun-08	13-Jun-08	20-Jun-08	27-Jun-08	11-Jul-08
4	18-Jul-08	25-Jul-08	01-Aug-08	08-Aug-08	15-Aug-08	22-Aug-08	29-Aug-08	12-Sep-08
5	19-Sep-08	26-Sep-08	06-Oct-08	13-Oct-08	17-Oct-08	24-Oct-08	31-Oct-08	14-Nov-08
6	21-Nov-08	28-Nov-08	05-Dec-08	12-Dec-08	19-Dec-08	26-Dec-08	05-Jan-09	16-Jan-09
7	23-Jan-09	30-Jan-09	06-Feb-09	13-Feb-09	20-Feb-09	27-Feb-09	06-Mar-09	20-Mar-09
8	27-Mar-09	03-Apr-09	08-Apr-09	17-Apr-09	24-Apr-09	01-May-09	08-May-09	22-May-09
9	29-May-09	05-Jun-09	12-Jun-09	19-Jun-09	26-Jun-09	03-Jul-09	10-Jul-09	24-Jul-09
10	31-Jul-09	07-Aug-09	14-Aug-09	21-Aug-09	28-Aug-09	04-Sep-09	11-Sep-09	25-Sep-09
11	02-Okt-09	09-Oct-09	16-Oct-09	23-Oct-09	30-Oct-09	06-Nov-09	13-Nov-09	26-Nov-09
12	04-Dec-09	11-Dec-09	17-Dec-09	23-Dec-09	04-Jan-10	08-Jan-10	15-Jan-10	29-Jan-10
13	05-Feb-10	12-Feb-10	19-Feb-10	25-Feb-10	05-Mar-10	12-Mar-10	19-Mar-10	01-Apr-10
14	09-Apr-10	16-Apr-10	23-Apr-10	30-Apr-10	07-May-10	14-May-10	21-May-10	04-Jun-10
15	11-Jun-10	18-Jun-10	25-Jun-10	02-Jul-10	09-Jul-10	16-Jul-10	23-Jul-10	06-Aug-10
16	13-Aug-10	20-Aug-10	27-Aug-10	03-Sep-10	07-Sep-10	17-Sep-10	24-Sep-10	08-Oct-10
17	15-Oct-10	22-Oct-10	29-Oct-10	05-Nov-10	12-Nov-10	19-Nov-10	26-Nov-10	10-Dec-10
18	17-Dec-10	23-Dec-10	30-Dec-10	07-Jan-11	14-Jan-11	21-Jan-11	28-Jan-11	11-Feb-11
19	18-Feb-11	25-Feb-11	04-Mar-11	11-Mar-11	18-Mar-11	25-Mar-11	01-Apr-11	15-Apr-11
20	21-Apr-11	29-Apr-11	06-May-11	13-May-11	20-May-11	27-May-11	01-Jun-11	17-Jun-11
21	24-Jun-11	01-Jul-11	08-Jul-11	15-Jul-11	22-Jul-11	29-Jul-11	05-Aug-11	19-Aug-11
22	26-Aug-11	05-Sep-11	09-Sep-11	16-Sep-11	23-Sep-11	30-Sep-11	07-Oct-11	21-Oct-11
23	28-Oct-11	04-Nov-11	11-Nov-11	18-Nov-11	25-Nov-11	02-Dec-11	09-Dec-11	23-Dec-11
24	30-Dec-11	06-Jan-12	13-Jan-12	20-Jan-12	27-Jan-12	03-Feb-12	10-Feb-12	24-Feb-12
25	02-Mar-12	09-Mar-12	16-Mar-12	22-Mar-12	30-Mar-12	05-Apr-12	13-Apr-12	27-Apr-12
26	04-May-12	11-May-12	16-May-12	25-May-12	01-Jun-12	08-Jun-12	15-Jun-12	29-Jun-12
27	06-Jul-12	13-Jul-12	20-Jul-12	27-Jul-12	03-Aug-12	10-Aug-12	16-Aug-12	31-Aug-12
28	07-Sep-12	14-Sep-12	21-Sep-12	28-Sep-12	05-Oct-12	12-Oct-12	19-Oct-12	02-Nov-12
29	09-Nov-12	14-Nov-12	23-Nov-12	07-Dec-12	14-Dec-12	21-Dec-12	28-Dec-12	04-Jan-13

Source: IDX Statistic (computed)

Each portfolio interval then will be sorted to meets the criteria of the research. It could be sorted by trading volume, sorted by past returns, sorted by market capitalization, sorted by BM value, etc. After the portfolio formed, then it will be evaluated over a period of 1, 3, 5, 10, and 20 scheduled as follow:

Figure 2. 3
Evaluation Period

Interval	Formation Period	Evaluation Period				
		1	3	5	10	20
1	06-Mar-08	19-Mar-08	04-Apr-08	18-Apr-08	23-May-08	01-Ags-08
2	09-May-08	23-May-08	06-Jun-08	20-Jun-08	25-Jul-08	06-Okt-08
3	11-Jul-08	25-Jul-08	08-Aug-08	20-Aug-08	26-Sep-08	05-Dec-08
4	12-Sep-08	26-Sep-08	13-Oct-08	24-Oct-08	28-Nov-08	06-Feb-09
5	14-Nov-08	28-Nov-08	12-Dec-08	26-Dec-08	30-Jan-09	08-Apr-09
6	16-Jan-09	30-Jan-09	13-Feb-09	27-Feb-09	03-Apr-09	12-Jun-09
7	20-Mar-09	03-Apr-09	17-Apr-09	01-May-09	05-Jun-09	14-Aug-09
8	22-May-09	05-Jun-09	19-Jun-09	03-Jul-09	07-Aug-09	16-Oct-09
9	24-Jul-09	07-Aug-09	21-Aug-09	04-Sep-09	09-Oct-09	17-Dec-09
10	25-Sep-09	09-Oct-09	23-Oct-09	06-Nov-09	11-Dec-09	19-Feb-10
11	26-Nov-09	11-Dec-09	23-Dec-09	08-Jan-10	12-Feb-10	23-Apr-10
12	29-Jan-10	12-Feb-10	25-Feb-10	12-Mar-10	16-Apr-10	25-Jun-10
13	01-Apr-10	16-Apr-10	30-Apr-10	14-May-10	18-Jun-10	27-Aug-10
14	04-Jun-10	18-Jun-10	02-Jul-10	16-Jul-10	20-Aug-10	29-Oct-10
15	06-Aug-10	20-Aug-10	03-Sep-10	17-Sep-10	22-Oct-10	30-Dec-10
16	08-Oct-10	22-0ct-10	05-Nov-10	19-Nov-10	23-Dec-10	04-Mar-11
17	10-Dec-10	23-Dec-10	07-Jan-11	21-Jan-11	25-Feb-11	06-May-11
18	11-Feb-11	25-Feb-11	11-Mar-11	25-Mar-11	29-Apr-11	08-Jul-11
19	15-Apr-11	29-Apr-11	13-May-11	27-May-11	01-Jul-11	09-Sep-11
20	17-Jun-11	01-Jul-11	15-Jul-11	29-Jul-11	05-Sep-11	11-Nov-11
21	19-Aug-11	05-Sep-11	16-Sep-11	30-Sep-11	04-Nov-11	13-Jan-12
22	21-Oct-11	04-Nov-11	18-Nov-11	02-Dec-11	06-Jan-12	16-Mar-12
23	23-Dec-11	06-Jan-12	20-Jan-12	03-Feb-12	09-Mar-12	16-May-12
24	24-Feb-12	09-Mar-12	22-Mar-12	05-Apr-12	11-May-12	20-Jul-12
25	27-Apr-12	11-May-12	25-May-12	08-Jun-12	13-Jul-12	21-Sep-12
26	29-Jun-12	13-Jul-12	27-Jul-12	10-Aug-12	14-Sep-12	23-Nov-12

Source: IDX Statistic (computed)

3.5.2 T-test

T-test used in this research is paired T-test. The purpose of this test is to determine the difference of the samples. Paired sample is a sample with the same subject but under different treatments or measurements. Test performed by T-test and compared the result with T-table. T-test performed in this research used to

compare returns of each evaluation period with 2-tails, 25 degree of freedom, and 95% confidence level. Thus the following requirements are as follows:

- If p value > 0.05, then it means average return of both samples is identic or there is no difference at all.
- If p value < 0.05, then it means average return of both samples is not identic or they are higher or lower.

There will be 4 part of the T-Test which will be performed on each hypotheses testing. Generally, there will be T-test to differentiate returns for high volume portfolios at formation period and evaluation period, T-test to differentiate returns for low volume portfolios at formation period and evaluation period, T-test to differentiate returns between high and low volume portfolios at formation period and evaluation period, and the last one is T-test to differentiate returns of high and low volume portfolios at each evaluation period.

3.5.3 Hypothesis Testing

1. First Hypothesis testing, "There is a difference in expected returns between extreme high volume and extreme low volume portfolios in Indonesia Stock Exchange during 2008-2012 period"

   The reference portfolios is the equal weight average of the Indonesia composite index (IHSG), which is a proxy for the market portfolio. This approach has two advantages: first, weights for each trading interval are implicitly adjusted according to the number of stocks experiencing high and low volumes during the interval; and second, since each long position is offset

by a short position in the market portfolio, this method effectively controls for market risk, and ensures zero net investment to each portfolio at all times.

The stock in each interval will be sorted based on its trading volume and divided into decile based on the volume. A stock is classified as extremely high volume if its volume is on top 10% of the formation period and classified as extremely low volume if its volume is in the bottom 10% of the formation period which means 8 stocks in each class. The high- and low-volume portfolios then evaluated at a period of 1, 3, 5, 10, and 20 week after the formation period for all trading interval. The choice of various holding periods provides a robustness test for this research's results.

To determine average returns to the long position of high-volume stocks ($\hat{R}^h$) and low-volume stocks ($\hat{R}^l$) over all trading intervals, this research uses formulas as follows:

$$\hat{R}^h = \frac{\sum_{i=1}^{k} \sum_{j=1}^{N_i^h} R_{ij}^h}{\sum_{i=1}^{k} N_i^h} \quad \text{.....(3.4)}$$

and

$$\hat{R}^l = \frac{\sum_{i=1}^{k} \sum_{j=1}^{N_i^l} R_{ij}^l}{\sum_{i=1}^{k} N_i^l} \quad \text{.....(3.5)}$$

Whereas:

$\hat{R}^h$ = return to high-volume stock

$\hat{R}^l$ = return to low-volume stock

i = trading interval

N_i^h = number of high-volume stock

N_i^l = number of low-volume stock

k = number of trading intervals

After all average returns in each trading interval calculated, T-test will be performed to determine the difference between extreme high volume and extreme low volume portfolios through the evaluation periods. H1 will be accepted if p value is < 0.050.

2. Second Hypothesis testing, "There is a difference in expected returns between extreme high volume-winner stocks and extreme low volume-loser stocks portfolios in Indonesia Stock Exchange during 2008-2012 period"

Baker and Stein (2004) said that stocks that experience extreme volumes are associated with lower expected returns for past winners than for past losers if trading volume acted as a sentiment indicator. The liquidity premium hypothesis does not appear to suggest a priori relation between liquidity premiums and past stock performance. Thus, evidence on the variation of volume–return relation with past stock performance is useful to distinguish between the behavioral and the liquidity premium hypotheses.

To proceed, this research compute average returns to portfolios formed by interacting between extreme volumes and past stock performance. In each reference period in one trading interval, stocks are first classified into high and low volume by its trading volume. Different from the volume-return testing, this time the stock divided into quartile based on its volume. A stock is classified as extremely high-volume if its volume is in the top 25% of the reference period and classified as extremely low-volume if its volume is in the bottom 25% of the reference period. So the extreme high and extreme low class is each consisted of 20 stocks. Then both class sorted again by its return and each divided into quartile. A stock is classified as winner if its return is among the top 25% of the high-volume class and classified as loser if its return is among the bottom 25% of the low-volume class. So there are 5 stocks labeled as high volume-winner and 5 stocks labeled low volume-loser in a reference period. A final portfolio will formed at the formation period at the end of reference periods which consist of stocks which remain at the top 25% and bottom 25% during prior 7 weeks reference periods.

The high volume-winner stocks and low volume-loser stocks portfolios formed at formation period then evaluated over a period of 1, 3, 5, 10, and 20 weeks evaluation period to determine the performance. To determine average returns to the long position of extreme high-volume stocks ($\hat{R}^h$) and extreme low-volume stocks ($\hat{R}^l$) over all trading intervals will be the same with the previous testing and will be used for the rest of the testing. After all average returns in each trading interval calculated, T-test will be performed to

determine the difference between extreme high volume-winner stocks and extreme low volume-loser stocks portfolios through the evaluation periods. H2 will be accepted if - p value is < 0.050.

3. Third Hypothesis Testing, "There is a difference in expected returns between extreme high volume-large stocks and extreme low volume-loser stocks portfolios in Indonesia Stock Exchange during 2008-2012 period"

Analysis on how extreme volume and return varies with firm size also helps distinguish between the liquidity premium and the behavioral hypotheses. Usually, large stocks are in general more liquid than small stocks. Therefore, this research expect that the extreme volume–return relation is more pronounced for small stocks than for large stocks if trading volume proxies for liquidity. A different finding tends to tilt our inference towards the alternative hypothesis—the behavioral hypothesis.

To examine this issue, we form portfolios by interacting between firm size and extreme volumes. Using the similar technique discussed previously, in each formation period, first sort all eligible stocks into high and low volume groups based on the volume. A stock is classified as extreme high volume if its volume is in the top 25% and classified as extreme low volume if its volume is in the bottom 25% so each class has 20 stocks. In each size sorted group, stocks are further split into the large or small stocks by sorting it based on its market capitalization as the measurement of size. A stock is classified as large stock if its size is among the top 25% and classified as small stock if its size is

among the bottom 25% and therefore, there will be 5 stocks labeled as extreme high volume-large stocks and extreme low volume-small stocks in each group.

The extreme high volume-large stocks and extreme low volume-small stocks portfolios formed at formation period then evaluated over a period of 1, 3, 5, 10, and 20 weeks evaluation period to determine the performance. After all average returns in each trading interval calculated, T-test will be performed to determine the difference between extreme high volume-large stocks and extreme low volume-small stocks portfolios through the evaluation periods. H3 will be accepted if p value is < 0.050.

4. Fourth Hypothesis Testing, "There is a difference in expected returns between extreme high volume-glamour stocks portfolios and extreme low volume-value stocks portfolios in Indonesia Stock Exchange during 2008-2012 period."

   A security's BM is shown to be one of the important firm characteristics associated with the variation in the cross section of expected returns. Fama and French (1993, 1996) contend that BM is a proxy for the security's loadings on rational risk factors, whereas Lakonishok et. al. (1994) argue that the BM effect represents the premium for relative distress, which is caused by investor irrationality. If BM effect is caused by investor irrationality and trading volume also proxies the sentiment of irrational investors, there will be expectation that the BM effect is associated with trading volume. In particular, low-BM stocks that experience extremely high volumes are associated with lower returns than those experiencing extremely low volumes.

To examine this possibility, this research use the same sorting technique as before, and first sort all eligible stocks into high and low volume groups based on the volume. A stock is classified as extreme high volume stock if its volume is in the top 25% and classified as extreme low volume stock if its volume is in the bottom 25% so each class has 20 stocks. In each size sorted group, stocks are further split into the glamour or value stocks by sorting it based on its BM value. A stock is classified as glamour stock if its BM value is among the bottom 25% of the high volume group and classified as value stock if its size is among the top 25% of the low volume group. Therefore, there will be 5 stocks labeled as extreme high volume-glamour stocks and extreme low volume-value stocks in each group.

The extreme high volume-glamour stocks and extreme low volume-value stocks portfolios formed at formation period then evaluated over a period of 1, 3, 5, 10, and 20 weeks evaluation period to determine the performance. After all average returns in each trading interval calculated, T-test will be performed to determine the difference between extreme high volume-glamour stocks and extreme low volume-value stocks portfolios through the evaluation periods. H4 will be accepted if p value is < 0.050.